GOVERNMENT OF DUBAI

بلدية دبي
DUBAI MUNICIPALITY

Dubai Municipality

Health and Safety Department

Technical Guideline on

Personal Protective Equipment – Hand Protection

DM-HSD-GU98-PPEHP2

CONTENTS

1. INTRODUCTION

The hand probably is the most physically used part of the body in conducting work and day to day activities. Accordingly, the hands' risk of sustaining harm and injury due to exposure to various workplace hazards are great and needs to be provided with appropriate hand protection whether it be elimination, engineering control, safe systems of work and other safety arrangements such as providing workers with protective gloves suitable to the activity being carried out.

The employers are mandated in Dubai Municipality's Local Order 61/1991, Article 38.4 to *"Take every precaution necessary for the protection of the worker and ensure his safety from occupational illness or potential work accident".* Workers protection is further stressed in this technical guideline to serve as a guidance for employers to safeguard the employees from foreseeable hazards that may cause hand and arm injuries.

Employers must prioritize the proper conduct of hazard identification and be proactive in ensuring that engineering control, safe systems of work and other risk control measures are in place, properly implemented, reviewed and revised as needed to eliminate or reduce occupational risks. Provision of personal protective equipment shall be considered only if elimination of hazards is not possible. Protective gloves provides additional layer of protection in conjunction with other control measures in place and serves as the last line of defence in ensuring the wellbeing of workers from hazardous chemical exposures, excessive heat or cold, electricity, ionizing radiation, impacts, environmental conditions and other hazards in the workplace .

2. PURPOSE

This technical guideline was developed to provide the necessary guidance to employers on selecting and providing their workers the appropriate type of protective gloves while considering various factors such as nature of work, level of protection afforded, duration of work activity, etc. Selected hand and arm protective equipment shall conform to UAE and international standards and be comfortable for use.

3. SCOPE

This technical guideline, shall apply to all commercial and industrial establishments, public or government institutions, including construction-related project sites in the emirate of Dubai.

This document provides guidelines and information on proper selection, general performance requirements, use, training, care, maintenance and replacement of hand and arm protective equipment. This technical guideline does not cover the following types of gloves:

- fashion or recreational gloves;
- gloves used in boxing or other sports;
- medical gloves;
- protective gloves used by civil defence, police and military.

4. DEFINITION

Unless the context otherwise requires, the following terms shall be deemed to mean the definitions hereby assigned to them.

Glove

A type of personal protective equipment used to provide protection to the hand or part of the hand against hazards. Gloves can also provide additional covering to the forearm and arm depending on the type.

Hand

The end part of the human arm which consists of the palm, fingers, thumb and wrist.

Dexterity

The skill or ability to perform tasks with the hand.

5. GUIDELINES

A. Hazard Identification and Risk Assessment

The employer shall conduct a thorough hazard identification in the workplace to assess the risk of hand and arm exposure from workplace hazards, including those which may be encountered during emergency situations taking into account the adequacy of any existing controls.

Workers are exposed to various occupational hazards that may cause hand and arm injuries and the employer should be aware of the likelihood of multiple and simultaneous hazard exposures. The following are the examples which could necessitate the use of hand and arm protective equipment:

- handling, usage and/or exposure to hazardous chemicals, radioactive materials and microbiological specimens/samples;
- contact with cutting hazards while carrying out activities with the use of tools or machineries containing sharp edges, fans, rotary valves, augers, etc.;
- penetration caused by pointed objects such as sharps/needles, nails, splinters or even puncture wounds inflicted by animals which had bitten;
- abrasion due to contact with rough materials or surfaces such as concrete blocks, rocks, sand, rope, etc.;
- exposure to extreme temperature due to work in cold environments (walk in freezer, chiller), hot areas or surfaces (foundries, metalworking), etc.;
- exposure to extreme temperature related to products or processes such as compressed gases, cryogenic materials, torching of metals, welding, etc.;
- exposure to repeated, prolonged or severe vibration while using compactor, chainsaw, jackhammer, etc.;
- potential contact with live electrical hazards due to exposed or faulty parts or systems;
- working in explosive or sensitive areas wherein electrostatic discharge is a concern (paint manufacturing, electronics, parts assembly), etc.

Having identified the hazards, completed the risk assessment and having taken account of existing controls, the organization should be able to determine whether existing controls are adequate or needs improvement, or if new controls are required.

If new or improved controls are required, selection should be determined by the principle of the hierarchy of hazard controls which includes elimination or minimization through engineering, administrative and personal protective equipment controls.

Hazard identification shall be undertaken by individual(s) who have the necessary capability and competence in relevant hazard identification methodologies and techniques and have suitable knowledge of the work being conducted.

B. Hand and Arm Protective Equipment Selection Criteria and Procedures

If the identified risks are still not eliminated or reduced to an acceptable level, the next step is to ensure that an appropriate hand and arm protective equipment is provided by the employer to the employees to

further reduce the risks. Employers shall develop procedures in selecting appropriate personal protective equipment that will offer the desired protection and comfort and not to create additional safety problems. Throughout the process of selection the following are examples of factors that needs to be accounted:

Anticipated potential hazards

In order to select the appropriate hand and arm protective equipment with the necessary level of protection, the employer shall identify the potential workplace hazards and its potential or probability of exposure to a worker.

Type of job/chemical handled

Specific job function being performed by the worker or type of chemical being handled greatly influences the selection and features of hand and arm protective equipment. Protective equipment selected for the workplace should be suitable for the actual work being carried out while providing the necessary protection, visibility and will not hinder the wearer's movements.

Nature and duration of contact

The nature of contact (e.g. splash, total immersion, etc.) and the duration of time that the protective gloves will be worn shall be considered to ensure that the area requiring protection is known (forearm, arm or hand only) and that the appropriate level of protection is provided during the whole duration while it is being worn.

Grip requirements

Grip is an important aspect to be considered since different work activities and processes require different touch sensitivity and grip requirements. Selected protective glove providing suitable grip and sensitivity will lessen rate of hand related injuries and will improve work productivity.

Comfort and Fitness

When in use, selected hand and arm protective equipment shall be comfortable as possible and of proper fit to encourage regular usage from workers. Many reported hand injuries were as a result of not wearing gloves and those reported with injuries wearing gloves are either not using the proper glove or is incorrectly worn. Wearing a proper glove is considered one of the most effective protection programs in protecting the hand of the workers.

Employers must properly measure the hands of the employees for safety gloves and must measure once again if the protective equipment will be replaced. The employer may ask guidance from selected supplier to determine proper sizing. It is also vital that the workers try on the gloves and how it feels. Gloves which feels awkwardly, too tight, decreases dexterity or causes perspiration are deemed not of the right fit. Properly fitting hand and arm protective equipment should feel comfortable while allowing for maximum possible dexterity while meeting the necessary protection against the type and risk of the activity.

Skin Allergy

Prior selection and purchase of protective gloves, the employer shall determine if workforce have allergic reactions to natural rubber latex proteins and/or synthetic chemicals in the glove material (Allergy determination can be done thru survey, medical records if available, allergy test, etc.). If identified, the employer shall provide the worker(s) with other suitable protective glove.

Employer must ensure that protective equipment manufacturer and its authorized supplier/representative shall identify and list all the substances in the glove which are known to cause allergic reactions.

C. Safe Systems of Work

Employers are required to implement safe systems of work in every work site which includes information, training, instruction and supervision. Safe systems of work must be properly communicated to all stakeholders detailing potential hazards, duties and responsibilities, procedures and guidelines. Ensure that workers are properly supervised in the proper and diligent use of hand and arm protective equipment.

Safety management systems shall be properly reviewed and revised to assess effectiveness and suitability of existing control measures and use of protective gloves.

D. Protective Gloves General Requirements

Employers must ensure to provide adequate and appropriate hand and arm protective equipment to workers involved in processes and activities or work areas wherein there is a reasonably foreseeable risk of hand and arm injury.

Employers should purchase hand and arm protective equipment from manufacturers or traders which has a valid conformity certificate for personal protective equipment products from Emirates Authority for Standardization and Metrology (ESMA) and/or conforms to international standards such as BS, EN, ISO, ANSI, ASTM, etc.

Protective gloves shall be selected that when used under foreseen conditions that is designed for, the wearer can perform the hazard related activity normally while having the highest possible degree of protection.

Protective gloves when used according to the manufacturer's instructions shall provide protection without harm to the wearer.

Each worker shall be issued with protective gloves individually.

The gloves, if required, shall be designed to minimize the time needed for donning and doffing.

Ensure that gloves properly cover the skin. Gloves selection should be of appropriate length to ensure that gap will not be observed between the glove and sleeve.

When gloves includes seams, the strength and material of the seams should not reduce the overall performance of the glove. The gloves shall meet the specified test methods and requirements of the standard(s) it is referenced to.

Glove materials, incorporated substances, seams, edges, degradation products and parts in contact with the wearer shall not adversely affect the health and hygiene of the wearer.

Protective equipment manufacturer and its authorized supplier/representative shall identify and list all the substances in the glove which are known to cause allergic reactions.

Maximum possible level of wearer comfort shall be provided by the protective gloves considering the level of protection needed, work environmental conditions, physical movements of the wearer and expected duration of use.

Selected protective gloves shall be compatible with other personal protective equipment to form a complete PPE ensemble while meeting the desired level of protection for each of the respective protective equipment applicable standard(s).

When tested in accordance with the below standards, all layers of protective gloves shall meet the following requirements:

- quantity of chromium VI in leather garments shall not exceed 3.0 mg/kg according to test method described in ISO 17075;
- pH value of the protective gloves shall be greater than 3.5 and less than 9.5 in accordance with EN ISO 4045 (leather material) and EN 1413 (other materials);
- natural rubber gloves shall conform to the requirements of EN 455-3 for extractable protein content.

When use of anti-static gloves are required, the gloves designed to reduce the risk of electrostatic properties shall meet relevant conformity tests such as EN 1149-1 or EN 1149- 2 or EN 1149-3. Test result shall be made available by the information supplied by the manufacturer.

The level of performance of the gloves should not be reduced throughout the recommended number of cleaning cycles as provided in the care instructions by the manufacturer.

Glove should offer the maximum possible level of dexterity for its activity purpose. Dexterity of the gloves is dependent on several factors such as glove material elasticity, deformability, thickness, etc.

When use of gloves with water vapor transmission is required the glove shall meet the test requirements of relevant standards such as EN 420:2003, ASTM E96, etc.

For work activities which exclude or inhibit water vapor transmission, the gloves shall be selected to reduce the effect of perspiration as much as possible.

E. Safety Instructions and Markings

All hand and arm protective equipment shall be provided with manufacturer's instructions indicating intended usage, method of fitting and adjustment, donning and doffing, limitations of use, storage and maintenance, cleaning, etc.

Employer must ensure that every user must be informed of the instructions and that employees must adhere to the specified manufacturer's instructions on the use, fitting, care, maintenance and other guidelines for protective gloves.

Furthermore, hand and arm protective equipment claimed to comply with the related international and UAE standards specific for its intended use shall bear respective pictograms or markings and the following information:

- reference safety standard such as EN 420, ANSI/ISEA 105, etc.;
- the manufacturers' or its authorized representatives' name and address;
- glove and size designation;
- mode of use;
- test to be carried out by the user prior use if necessary;
- date of obsolescence (If the protective performances of the glove can be significantly affected by ageing);
- precautions to be observed, etc.

Affixed glove marking shall be legible, indelible and visible throughout the service life of the glove. If marking is not possible due to the glove characteristic, its packaging then should be provided with marking.

F. Training

Employers are required to provide PPE training for employees and even visitors. Records of any training including induction and tool box talks shall be properly kept for at least five (5) years and be made readily available to Dubai Municipality OHS inspectors and other regulatory agencies for review and demonstrate compliance with pertinent UAE and DM regulations.

Scope of training may include workplace risks, preventive measures, legal obligations, when to use protective gloves, proper use, fitting and care, safe practices and replacement, etc.

Trainers must inform users that the use of personal protective equipment such as protective gloves are not to be relied upon in providing unlimited protection against hazards and are not substitutes for sound risk control measures but should be used in conjunction with engineering controls and sound safety practices.

G. Safe Use Provisions

Wearers of hand and arm protective equipment should thoroughly inspect and test gloves prior use. Glove material shall be checked for cuts, cracks, punctures, tears, brittleness, discoloration, stiffness, etc. Rubber or synthetic gloves shall be tested for pin holes or leaks.

Damaged protective glove shall be reported to a responsible person for appropriate action which includes disposal and replacement.

Employee shall report to the management if the issued protective glove is not properly fitting, uncomfortable or limits/hinders movement prior start of work.

Persons wearing protective gloves should have proper understanding of its proper use, its limitation, fitting, care, etc.

Persons shall properly and diligently use appropriate protective gloves if required. Employer shall always consider hazard control hierarchy. Use of PPE to control hazards is the least effective method.

While conducting work activity, worker shall periodically check worn protective gloves for damages such as punctures, tears or seam discontinuities. Worn out or torn gloves shall not be used and shall be reported to a responsible person replacement.

Workers involved in handling and using of chemicals should also be aware of changes in protective gloves due to chemical attack such as stiffening, swelling or softening should be noted since permeation can occur even without any visible effects on the protective material.

Any protective gloves which has been observed to be damaged or degraded shall be removed and replaced as safe as possible.

Employees shall ensure that chemically or biologically contaminated protective gloves shall be properly removed, cleaned, disposed or stored as per manufacturers' instructions to avoid spread of contamination.

Protective gloves with metallic or conductive parts shall not be worn to avoid accidental contact with live electrical sources or equipment.

Disposable gloves shall not be reused and shall be discarded properly.

Properly wash hands before wearing and after removal of gloves to avoid contamination and other health hazards such as food poisoning.

Cut resistant gloves shall not be used when operating or working near powered rotating or cutting equipment or parts. Gloves with cut resistant properties were designed and tested for use with non-powered blades and sharps only. Employer shall consider hazard elimination or combination of other control measures such as engineering and administrative for these types of equipment.

H. Care, Maintenance and Replacement

Protective gloves shall be properly stored in a clean and well-ventilated area and not exposed to direct sunlight, excessive heat, humidity, ozone and hazardous chemicals and contaminants (e.g. acids, toxic substances) that may cause the gloves to degrade over time.

Periodically inspect protective gloves for cuts, imperfect seams, pinholes, punctures, tears, cracks and other signs of damage or deterioration.

Washing and cleaning shall be done in accordance with manufacturers' instructions.

Persons conducting washing or cleaning of chemically contaminated protective gloves must be informed on safety procedures to be observed.

If during the application of washing/cleaning procedures that there is an observed significant reduction of the gloves' performance properties, the protective glove shall be marked and be reported to a responsible person for appropriate action which includes disposal and replacement.

Protective gloves that have been heavily contaminated with hazardous chemicals such as toxic substances shall be discarded, not re-used and be stored in a container or in a secured area with appropriate safety signage.

Contaminated protective gloves that cannot be properly cleaned shall be disposed in accordance with Dubai Municipality regulations.

6. REFERENCES

American National Standard Institute/International Safety Equipment Association: American National Standard for Hand Protection (ANSI/ISEA 105-2016).

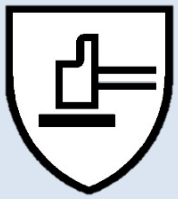
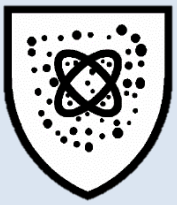
European Standard: Protective Gloves against Mechanical Risks (EN 388:2016).

European Standard: Protective Gloves – General Requirements and Test Methods (EN 420:2003+A1:2009).

U.S. Department of Energy: Occupational Safety and Health Technical Reference Manual

ANNEX A: PROTECTIVE GLOVES PICTOGRAMS

Protective gloves which claims to comply with BS and EN standards shall have the following pictograms indicating its assigned protection and intended use. Pictograms referenced from EN 420:2003+A1:2009

PICTOGRAM	ASSIGNED PROTECTION	PICTOGRAM	ASSIGNED PROTECTION
	Mechanical Hazards		Cold Hazard
	Impact Cut		Chemical Hazards
	Heat and Flame		Hand Held Chain Saws
	Ionizing Radiations		Radioactive Contamination
	Chemical Hazards (Complying to Requirements in 5.2.1 of EN:374-1:2003)		Micro-organism Hazards

ANNEX B: CUT RESISTANCE COMPARISON BETWEEN EN 388:2016 AND ANSI/ISEA 105-2016

EN 388:2016 will continue to use the Coup Cut Test but will include an additional cut test ISO 13997 which is similar to ASTM F 2992-15 of ANSI/ISEA 105-2016 which uses the TDM 100 Cut Test Machine. EN Standard considered the additional cut test to accommodate the limitation caused by the Coup Cut Test. Below is the comparison between the two standards using the TDM 100 Cut Test Machine.

EN 388:2016			ANSI/ISEA 105-2016		
Cut Level	**Cut Resistance**	**Hazard Protection**	**Cut Level**	**Cut Resistance**	**Hazard Protection**
EN CUT LEVEL A	2 Newtons/ 203 grams	Light Cut Hazards	ANSI CUT LEVEL A1	200 grams	Light Cut Hazards
EN CUT LEVEL B	5 Newtons/ 509 grams	Light to Medium Cut Hazards	ANSI CUT LEVEL A2	500 grams	Light to Medium Cut Hazards
EN CUT LEVEL C	10 Newtons/ 1019 grams	Light to Medium Cut Hazards	ANSI CUT LEVEL A3	1000 grams	Light to Medium Cut Hazards
EN CUT LEVEL D	15 Newtons/ 1529 grams	Medium Cut Hazards	ANSI CUT LEVEL A4	1500 grams	Medium Cut Hazards
EN CUT LEVEL E	22 Newtons/ 2243 grams	Medium to High Cut Hazards	ANSI CUT LEVEL A5	2200 grams	Medium to High Cut Hazards
EN CUT LEVEL F	30+ Newtons/ 3059+ grams	High Cut Hazards	ANSI CUT LEVEL A6	3000 grams	High Cut Hazards
			ANSI CUT LEVEL A7	4000 grams	High Cut Hazards
			ANSI CUT LEVEL A8	5000 grams	High Cut Hazards
			ANSI CUT LEVEL A9	6000+ grams	High Cut Hazards

ANNEX C: CHEMICAL RESISTANCE SELECTION GUIDE FOR PROTECTIVE GLOVES

Specified below are examples of commonly used protective glove materials for chemical handling activities. Table below taken from U.S. Department of Energy (Occupational Safety and Health Technical Reference Manual) to serve as a guide. Ratings are subject to changes depending on the manufacturers' formulation, thickness, quality, etc.

CHEMICAL	NEOPRENE	LATEX/RUBBER	BUTYL	NITRILE
Acetaldehyde*	Very Good	Good	Very Good	Good
Acetic Acid	Very Good	Very Good	Very Good	Very Good
Acetone*	Good	Very Good	Very Good	Poor
Ammonium Hydroxide	Very Good	Very Good	Very Good	Very Good
Amyl Acetate*	Fair	Poor	Fair	Poor
Aniline	Good	Fair	Fair	Poor
Benzaldehyde*	Fair	Fair	Good	Good
Benzene*	Poor	Poor	Poor	Fair
Butyl Acetate	Good	Fair	Fair	Poor
Butyl Alcohol	Very Good	Very Good	Very Good	Very Good
Carbon Disulfide	Fair	Fair	Fair	Fair
Carbon Tetrachloride*	Fair	Poor	Poor	Good
Castor Oil	Fair	Poor	Fair	Very Good
Chlorobenzene*	Fair	Poor	Fair	Poor
Chloroform*	Good	Poor	Poor	Fair
Chloronaphthalene	Fair	Poor	Fair	Fair
Chromic Acid (50%)	Fair	Poor	Fair	Fair
Citric Acid (10%)	Very Good	Very Good	Very Good	Very Good
Cyclohexanol	Good	Fair	Good	Very Good
Dibutyl Phthalate*	Good	Poor	Good	Good
Diesel Fuel	Good	Poor	Poor	Very Good
Diisobutyl Ketone	Poor	Fair	Good	Poor
Dimethylformamide	Fair	Fair	Good	Good
Dioctyl Phthalate	Good	Poor	Fair	Very Good
Dioxane	Very Good	Good	Good	Good
Epoxy Resins, Dry	Very Good	Very Good	Very Good	Very Good
Ethyl Acetate*	Good	Fair	Good	Fair
Ethyl Alcohol	Very Good	Very Good	Very Good	Very Good
Ethyl Ether*	Very Good	Good	Very Good	Good
Ethylene Dichloride*	Fair	Poor	Fair	Poor
Ethylene Glycol	Very Good	Very Good	Very Good	Very Good
Formaldehyde	Very Good	Very Good	Very Good	Very Good
Formic acid	Very Good	Very Good	Very Good	Very Good
Freon 11	Good	Poor	Fair	Good
Freon 12	Good	Poor	Fair	Good

Note: *Chemicals marked with an asterisk (*) shall be used for limited service.*

When choosing the right type of protective gloves, ensure that the manufacturer's recommendations is consulted, especially if the gloved hand(s) will be immersed in the chemical.

Continuation of Annex C

Specified below are examples of commonly used protective glove materials for chemical handling activities. Table below taken from U.S. Department of Energy (Occupational Safety and Health Technical Reference Manual) to serve as a guide. Ratings are subject to changes depending on the manufacturers' formulation, thickness, quality, etc.

CHEMICAL	NEOPRENE	LATEX/RUBBER	BUTYL	NITRILE
Freon 21	Good	Poor	Fair	Good
Freon 22	Good	Poor	Fair	Good
Furfural*	Good	Good	Good	Good
Gasoline, leaded	Good	Poor	Fair	Very Good
Gasoline, unleaded	Good	Poor	Fair	Very Good
Glycerin	Very Good	Very Good	Very Good	Very Good
Hexane	Fair	Poor	Poor	Good
Hydrazine (65%)	Fair	Good	Good	Good
Hydrochloric acid	Very Good	Good	Good	Good
Hydrofluoric acid (48%)	Very Good	Good	Good	Good
Hydrogen peroxide (30%)	Good	Good	Good	Good
Hydroquinone	Good	Good	Good	Fair
Isooctane	Fair	Poor	Poor	Very Good
Kerosene	Very Good	Fair	Fair	Very Good
Ketones	Good	Very Good	Very Good	Poor
Lacquer thinners	Good	Fair	Fair	Poor
Lactic acid (85%)	Very Good	Very Good	Very Good	Very Good
Lauric acid (36%)	Very Good	Fair	Very Good	Very Good
Lineolic acid	Very Good	Poor	Fair	Good
Linseed oil	Very Good	Poor	Fair	Very Good
Maleic acid	Very Good	Very Good	Very Good	Very Good
Methyl alcohol	Very Good	Very Good	Very Good	Very Good
Methylamine	Fair	Fair	Good	Good
Methyl bromide	Good	Fair	Good	Fair
Methyl chloride*	Poor	Poor	Poor	Poor
Methyl ethyl ketone*	Good	Good	Very Good	Poor
Methyl isobutyl ketone*	Fair	Fair	Very Good	Poor
Methyl methacrylate	Good	Good	Very Good	Fair
Monoethanolamine	Very Good	Good	Very Good	Very Good
Moxpholine	Very Good	Very Good	Very Good	Good
Naphthalene	Good	Fair	Fair	Good
Napthas, aliphatic	Very Good	Fair	Fair	Very Good
Napthas, aromatic	Good	Poor	Poor	Good

Note: *Chemicals marked with an asterisk (*) shall be used for limited service.*

When choosing the right type of protective gloves, ensure that the manufacturer's recommendations is consulted, especially if the gloved hand(s) will be immersed in the chemical.

Continuation of Annex C

Specified below are examples of commonly used protective glove materials for chemical handling activities. Table below taken from U.S. Department of Energy (Occupational Safety and Health Technical Reference Manual) to serve as a guide. Ratings are subject to changes depending on the manufacturers' formulation, thickness, quality, etc.

CHEMICAL	NEOPRENE	LATEX/RUBBER	BUTYL	NITRILE
Nitric acid*	Good	Fair	Fair	Fair
Nitric acid, red and white fuming	Poor	Poor	Poor	Poor
Nitromethane (95.5%)*	Fair	Poor	Fair	Fair
Nitropropane (95.5%)	Fair	Poor	Fair	Fair
Octyl alcohol	Very Good	Very Good	Very Good	Very Good
Oleic acid	Very Good	Fair	Good	Very Good
Oxalic acid	Very Good	Very Good	Very Good	Very Good
Palmitic acid	Very Good	Very Good	Very Good	Very Good
Perchloric acid (60%)	Very Good	Fair	Good	Good
Perchloroethylene	Fair	Poor	Poor	Good
Petroleum distillates (naphtha)	Good	Poor	Poor	Very Good
Phenol	Very Good	Fair	Good	Fair
Phosphoric acid	Very Good	Good	Very Good	Very Good
Potassium hydroxide	Very Good	Very Good	Very Good	Very Good
Propyl acetate	Good	Fair	Good	Fair
Propyl alcohol	Very Good	Very Good	Very Good	Very Good
Propyl alcohol (iso)	Very Good	Very Good	Very Good	Very Good
Sodium hydroxide	Very Good	Very Good	Very Good	Very Good
Styrene	Poor	Poor	Poor	Fair
Styrene (100%)	Poor	Poor	Poor	Fair
Sulfuric acid	Good	Good	Good	Good
Tannic acid (65%)	Very Good	Very Good	Very Good	Very Good
Tetrahydrofuran	Poor	Fair	Fair	Fair
Toluene*	Fair	Poor	Poor	Fair
Toluene diisocyanate (TDI)	Fair	Good	Good	Fair
Trichloroethylene*	Fair	Fair	Poor	Good
Triethanolamine (85%)	Very Good	Good	Good	Very Good
Tung oil	Very Good	Poor	Fair	Very Good
Turpentine	Good	Fair	Fair	Very Good
Xylene*	Poor	Poor	Poor	Fair

Note: *Chemicals marked with an asterisk (*) shall be used for limited service.*

When choosing the right type of protective gloves, ensure that the manufacturer's recommendations is consulted, especially if the gloved hand(s) will be immersed in the chemical.

For any further information, please contact:

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